

CLAIMS:

1-16. (cancelled)

17. (currently amended) A method of enhancing the unipolar charge which is imparted to droplets of an emulsion on discharge from an aerosol spray device, the method comprising forming the droplets from an oil-in-water or a water-in-oil emulsion composition which comprises:

- (a) at least one propellant in an amount of about 2 to about 80% w/w;
- (b) at least one non-ionic surfactant in an amount of from about 0.01 to about ~~10%~~ 1.0% w/w, said surfactant being selected from the group consisting of: mono-, di- and tri-sorbitan esters; polyoxyethylene mono-, di- and tri-sorbitan esters; mono- and poly-glyceryl esters; alkoxyated alcohols; alkoxyated amines; alkoxyated acids; amine oxides; ethoxyated/proproxyated block copolymers; alkoxyated alkanolamides; and alkoxyated alkyl phenols;
- (c) optionally at least one solvent within an oil phase of the emulsion in an amount of up to about 80% w/w, said solvent being selected from the group consisting of n-paraffins, isoparaffins and naphthenes;
- (d) at least one component selected from the group consisting of polar, ionic and aromatic compounds, in an amount of about 0.1 to about ~~80%~~ 10% w/w based on the non-ionic surfactant, said component being selected from the group consisting of

- (I) alkali metal salts, alkaline earth metal salts, ammonium salts, amine salts or amino alcohol salts of at least one of the compounds selected from the group consisting of alkyl sulphates, alkyl ether sulphates, alkylamidoether sulphates, alkylaryl polyether sulphates, monoglyceride sulphates, polyglyceride sulphates, alkyl sulphonates, alkylamine sulphonates, alkyl-aryl sulphonates, olefin sulphonates, paraffin sulphonates, alkyl sulphosuccinates, alkylether sulphosuccinates, alkylamide sulphosuccinates, alkyl sulphocinnamates, alkyl sulphoacetates, alkyl phosphates, alkylether phosphates, acyl sarcosinates, acyl isothionates and N-acyl taurates,
- (II) alkyl amidopropylbetaines, alkylamidobetaines, alkylamidosulphobetaines, alkylbetaines, aminimides, quaternary ammonium compounds, quaternary phosphonium compounds, and
- (III) carboxylic acids, carboxylic acid salts, esters, ketones, aldehydes, amides or amines of carboxylic acids containing from 6 to 30 carbon atoms,
- (IV) ~~diethyl orthophthalate, methylphenylcarbinyl acetate, α -methyl ionone, 4-hydroxy 3-methoxy-benzaldehyde, phenylethyl alcohol, dipropylene glycol, styryl acetate, n-butyl benzoate, isopropyl 4-hydroxybenzoate, isobutyl acetophenone, isopropyl acetophenone, nicotinic acid, benzoic acid, 2-naphthol, neopentyl benzene, naphthalene, toluene, fullerene, tannic acid, t-butylacetophenone, isopropylcinnamate, resorcinol, 4-methoxycinnamaldehyde, arbutin, 4-acetoxy 3-~~

~~methoxycinnamaldehyde, 4-isopropylphenol, trans-stilbene, esculetin, p-chloro-m-xlenol, chloro-o-cresol, triclosan, norfenefrine, norepinephrine, hexyl-resoreinol, limonene, methylphenylcarbinyl acetate and p-tert-butyl- α -methylhydrocinnamic aldehyde,~~

in an amount such that a theoretical conductivity of the emulsion is less than a bulk conductivity of the emulsion and the difference is at least about $0.5\mu\text{S cm}^{-1}$; and

(e) water.

18. (previously presented) The method according to claim 17, wherein the solvent is present and is selected from the group consisting of n-paraffins and isoparaffins.

19. (previously presented) The method according to claim 18, wherein the solvent is present in an amount up to about 40% w/w.

20. (currently amended) A method of enhancing the electrostatic charge imparted to droplets of a composition in a form of a water-in-oil or an oil-in-water emulsion on discharge from an aerosol spray device in which the composition includes:

(a) at least one propellant in an amount of about 2 to about 80% w/w;

(c) optionally at least one solvent within an oil phase of the emulsion in an amount of up to about 80% w/w, said solvent being selected from the group consisting of n-paraffins, isoparaffins and naphthenes; and

(e) water;

the method comprising mixing with the composition (b) a non-ionic surfactant in an amount of from about 0.1 to about ~~10%~~ 1.0% w/w, said surfactant being selected from the group consisting of: mono-, di- and tri-sorbitan esters; polyoxyethylene mono-, di- and tri-sorbitan esters; mono- and poly-glyceryl esters; alkoxyated alcohols; alkoxyated amines; alkoxyated acids; amine oxides; ethoxyated/propoxyated block copolymers; alkoxyated alkanolamides; and alkoxyated alkyl phenols, and (d) at least one component selected from the group consisting of polar, ionic and aromatic compounds, in an amount of about 0.01 to about ~~80%~~ 10% w/w based on the non-ionic surfactant, said component being selected from the group consisting of

(I) alkali metal salts, alkaline earth metal salts, ammonium salts, amine salts or amino alcohol salts of at least one of the compounds selected from the group consisting of alkyl sulphates, alkyl ether sulphates, alkylamidoether sulphates, alkylaryl polyether sulphates, monoglyceride sulphates, polyglyceride sulphates, alkyl sulphonates, alkylamine sulphonates, alkyl-aryl sulphonates, olefin sulphonates, paraffin sulphonates, alkyl sulphosuccinates, alkylether sulphosuccinates, alkylamide sulphosuccinates, alkyl sulphocinnamates, alkyl

sulphoacetates, alkyl phosphates, alkylether phosphates, acyl sarcosinates, acyl isothionates and N-acyl taurates,

(II) alkyl amidopropylbetaines, alkylamidobetaines, alkylamidosulphobetaines, alkylbetaines, aminimides, quaternary ammonium compounds, quaternary phosphonium compounds, and

(III) carboxylic acids, carboxylic acid salts, esters, ketones, aldehydes, amides or amines of carboxylic acids containing from 6 to 30 carbon atoms,

(IV) ~~diethyl orthophthalate, methylphenylcarbinyl acetate, α -methyl ionone, 4-hydroxy 3-methoxy benzaldehyde, phenylethyl alcohol, dipropylene glycol, styryl acetate, n-butyl benzoate, isopropyl 4-hydroxybenzoate, isobutyl acetophenone, isopropyl acetophenone, nicotinic acid, benzoic acid, 2-naphthol, neopentyl benzene, naphthalene, toluene, fullerene, tannic acid, t-butylacetophenone, isopropylcinnamate, resorcinol, 4-methoxycinnamaldehyde, arbutin, 4-acetoxy 3-methoxycinnamaldehyde, 4-isopropylphenol, trans-stilbene, esculetin, p-chloro-m-xilenol, chloro-o-cresol, triclosan, norfenefrine, norepinephrine, hexyl-resorcinol, limonene, methylphenylcarbinyl acetate and p-tert-butyl α -methylhydrocinnamic aldehyde,~~

and the amount of the component being such that a theoretical conductivity of the emulsion is less than a bulk conductivity of the emulsion.

21. (previously presented) An aerosol spray device which contains an electrically neutral composition in a form of a water-in-oil emulsion, an oil-in-water emulsion or a single phase composition, in which liquid droplets of the composition on discharge from the aerosol spray device are imparted with a unipolar electrostatic charge, wherein a formulation of the composition and a material of a portion of the aerosol spray device with which the emulsion comes into contact on spraying are selected such that at least one of the following is true:

- i) a difference in the surface energies between a Lewis base component of the emulsion and a Lewis base component of the material with which the emulsion comes into contact on spraying is at about 2 mJ m^{-2} ; and
- ii) a difference in the surface energies between a Lewis acid component of the emulsion and a Lewis acid component of the material with which the emulsion comes into contact on spraying is at least about 0.5 mJ m^{-2} .

22. (previously presented) The aerosol spray device as claimed in claim 21, wherein at least one of the following is true: the difference in i) is at least about 5 mJ m^{-2} and the difference in ii) is at least about 1 mJ m^{-2} .

23. (previously presented) The aerosol spray device as claimed in claim 22, wherein at least one of the following is true: the difference in i) is at least about 15 mJ m^{-2} .

m^{-2} and the difference in ii) is at least about 2 mJ m^{-2} .

24. (currently amended) The aerosol spray device as claimed in claim 21, wherein the composition contained therein comprises:

- (a) at least one propellant in an amount of about 2 to about 80% w/w;
- (b) at least one non-ionic surfactant in an amount of about 0.01 to about ~~10%~~ 1.0% w/w, said surfactant being selected from the group consisting of: mono-, di- and tri-sorbitan esters; polyoxyethylene mono-, di- and tri-sorbitan esters; mono- and poly-glyceryl esters; alkoxyated alcohols; alkoxyated amines; alkoxyated acids; amine oxides; ethoxyated/proproxyated block copolymers; alkoxyated alkanolamides; and alkoxyated alkyl phenols,
- (c) optionally at least one solvent within an oil phase of the emulsion in an amount up to about 80% w/w said solvent being selected from the group consisting of n-paraffins, isoparaffins and naphthenes;
- (d) at least one component selected from the group consisting of polar, and aromatic compounds, in an amount of about 0.01 to ~~80%~~ 10% w/w based on the non-ionic surfactant, said component being selected from the group consisting of
 - (II) alkyl amidopropylbetaines, alkylamidobetaines, alkylamidosulphobetaines, alkylbetaines, aminimides, quaternary ammonium compounds, quaternary phosphonium compounds, and

(III) carboxylic acids, carboxylic acid salts, esters, ketones, aldehydes, amides or amines of carboxylic acids containing from 6 to 30 carbon atoms,

~~(IV) diethyl orthophthalate, methylphenylcarbiny acetate, α -methyl ionone, 4-hydroxy-3-methoxy-benzaldehyde, phenylethyl alcohol, dipropylene glycol, styryl acetate, n-butyl benzoate, isopropyl 4-hydroxybenzoate, isobutyl acetophenone, isopropyl acetophenone, nicotinic acid, benzoic acid, 2-naphthol, neopentyl benzene, naphthalene, toluene, fullerene, tannic acid, t-butylacetophenone, isopropylcinnamate, resorcinol, 4-methoxycinnamaldehyde, arbutin, 4-acetoxy-3-methoxycinnamaldehyde, 4-isopropylphenol, trans-stilbene, esculetin, p-chloro-m-xylene, chloro-o-cresol, triclosan, norfenefrine, norepinephrine, hexyl-resorcinol, limonene, methylphenylcarbiny acetate and p-tert-butyl α -methylhydrocinnamic aldehyde,~~

in an amount such that a theoretical conductivity of the emulsion is less than a bulk conductivity of the emulsion; and

(e) water.

25. (previously presented) The method according to claim 17 wherein the difference between the theoretical conductivity of the emulsion and the bulk conductivity of the emulsion is at least about $4 \mu\text{S cm}^{-1}$.

26. (previously presented) The method according to claim 25 wherein the difference between the theoretical conductivity of the emulsion and the bulk conductivity of the emulsion is at least about $6 \mu\text{S cm}^{-1}$.

27. (previously presented) The method according to claim 17 wherein at least about 90% by volume of the droplets of the disperse phase within the emulsion have an average diameter of less than about $60 \mu\text{m}$.

28. (previously presented) The method according to claim 27 wherein at least about 90% by volume of the droplets of the disperse phase within the emulsion have an average diameter in a range of about 20 to about $40 \mu\text{m}$.

29. (cancelled)

30. (currently amended) The method according to claim ~~29~~ 17 wherein the at least one non-ionic surfactant contains at least one alkyl, allyl or substituted phenyl group having at least one C_6 to C_{22} carbon chain.

31-33. (cancelled)

34. (previously presented) The method according to claim 17 wherein the droplets formed on discharge from an aerosol spray device have a charge to mass ratio of at least about $\pm 1 \times 10^{-4}$ C/kg.

35. (previously presented) The method according to claim 34 wherein the droplets formed on discharge from an aerosol spray device have a charge to mass ratio of at least about $\pm 2 \times 10^{-4}$ C/kg.

36. (previously presented) The method according to claim 17 in which the composition is an insecticidal composition that contains at least one insecticide in an amount of about 0.001 to about 5% w/w.